What is a law of nature?

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This is a very interesting question. From a philosophical point of view:
What are the laws of our Universe?
Why do they work this way?
Did they arise on their own or did someone "write" them?
Can they be changed (in the future) or are they still eternal?
The laws of the Universe exclude the evolution of the Universe or guarantee it?

We will try to answer some of these questions. But, before that, let's consider what the interaction of two systems is using the example of a virus. More precisely, using the example of the interaction of a virus (bacteriophage) and bacteria. If the bacteriophage is outside the bacteria, then it is just a mixture of large organic molecules. No more. It is almost impossible to distinguish this mixture of molecules from ordinary sugar: both the virus and the sugar are dead. Literally! They are just ordinary chemical molecules.

But, if the virus enters the bacterium, then a miracle happens: it literally comes to life and becomes a living being, which begins to copy itself quite consciously. It can be compared with a computer and a DVD-disk on which a film is recorded: without a computer, the DVD-disk is “dead”, but with a computer it comes to life and the film begins, or in our terms - “life”.

It is very important that the interaction of the two systems in the described examples is absolutely the same: one system (virus, DVD-disk) has a program of actions recorded on the medium, the other system (bacteria, computer) can “read” and implement this program, since it has the necessary resources. And therefore, when these systems interact, a completely expected interaction (programmed!) Occurs, which leads to a completely predictable result.

It can be argued that the programmed interaction of two such systems (for example, a virus - a bacterium) is a law of nature. In principle, this is how it really is. But, then it turns out that the laws of nature are programs written in a certain way. Please note that a virus is both a program and the material carrier of a program. In a DVD disc, the program and the medium are separated, here the program is "ideal", and the material medium has nothing to do with it (DVD disc, floppy disk, flash drive, etc.). In a virus, the program and its material carrier are one, that is, matter (virus particles) is literally programmed.

Considering the above, we can conclude that the laws of our Universe are certain programs written in the matter of the Universe itself (we are materialists). The most fundamental material carriers of our Universe, which by their interaction and create the Universe, are elementary particles (electrons, quarks, photons, etc.). Therefore, it is quite logical to assume that the laws of nature should be "written" precisely in elementary particles. Since the interaction of elementary particles with each other is our Universe. In fact, the laws of nature "guarantee" interaction by definition, just as the DNA/RNA of a virus guarantees "interaction" with a bacterium. If elementary particles did not interact with each other, then the Universe would not exist. It would just fall apart into non-interacting parts. Also, there would be no space-time continuum, which is "born" only if there is matter. Interacting matter!

But, this is not all. Most surprisingly, in computers, that is, DVDs, programs are written in a binary system. Earlier we have already come to the conclusion that in DNA, information is also recorded in a binary system [1], since programs in a binary system will be the most compact. Consequently, the laws of nature must also be written on material carriers (elementary particles) also in a binary system. How can this be? The answer is obvious: this is a particle-wave dualism. A complete analogy. Compare, the binary system used in computers: 0 - no current, 1 - there is current; and now, the binary system used in the Universe: 0 - de Broglie wave, 1 - corpuscle. And therefore, if we take a certain ensemble of interacting elementary particles, then we can always write a binary code, that is, a certain law according to which the interaction will take place. Quantum "boiling" of elementary particles, the absence of particle trajectories, etc. quantum effects and interactions, in fact, is that binary code, which is a law of nature. Surprisingly, we logically came to the conclusion that quantum mechanics is a law of nature written in a binary system. However, there is nothing surprising, since quantum mechanics studies the most fundamental level of being, and therefore expresses the most fundamental law of nature.

1. Bezverkhniy V. D., Bezverkhniy V. V. The origin of life, cybernetic theory of evolution and oxygen catastrophe. https://vixra.org/pdf/1912.0162v1.pdf
2. Quora: What is a law of nature? https://qr.ae/pNOrwZ